



Fiti.ai

**A Virtual Fitting Room
that takes online
shopping to the next level**

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Product Overview

Product Concept

AI Canvas

Product Team

Value of Data

Fiti.ai | Product Concepts

Quick & Easy to Use

Online synthesis of user and clothing images to generate try-on effects

Personalized Shopping

Accommodate different body shapes, sizes, and styles



Confident in purchasing

Reduce the number of returns and exchanges

Cost-effective solution

Reduce the need for physical store space and inventory waste





Opportunity

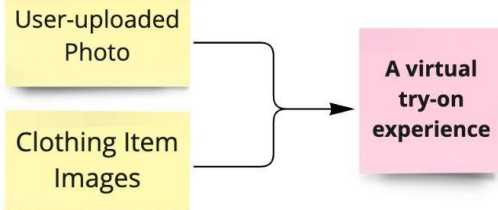
Why do it?

- Blended return rate of online apparel retail: **12.2%**
- consumer preference-based returns: **72%** of all returns

Global e-commerce apparel market: predicted compound annual growth rate of **8.6%** from 2022 to 2030

Solution - Fiti.ai | *Virtual Fitting Room for Everyone*

What is it?



Consumers

Who needs it?

Fashion Brands with Service Online

Fashion E-commerce Website

Individual Users

Data

What are the model inputs?

VITON - a dataset for virtual try-on of clothing items, consisting of 16,253 pairs of images of a person and a clothing item .

Strategy

Why us?

- Produce reliable and high-quality virtual try-on results
- Offer user-friendly interface

Policy & Process

What else must change?

more focus on protecting user privacy when using images

Transfer Learning

How will we build it?

Existing research on image-based virtual try-on (VTON)

Tools for maintaining MLOps and launching apps

Success Criteria

How will we know it works?

Better Model Evaluation Performance

Higher Human Scoring Results



Product TEAM



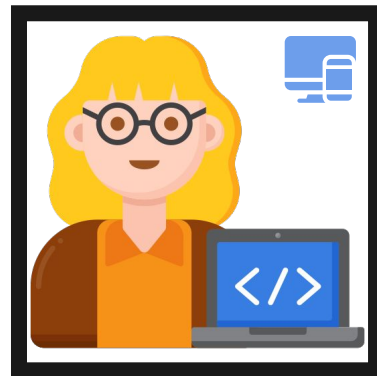
Data Engineer

Pre-process user photos with human parsing, pose and dense pose



Data Scientist

Develop style based appearance flow model, generating virtual try-on images

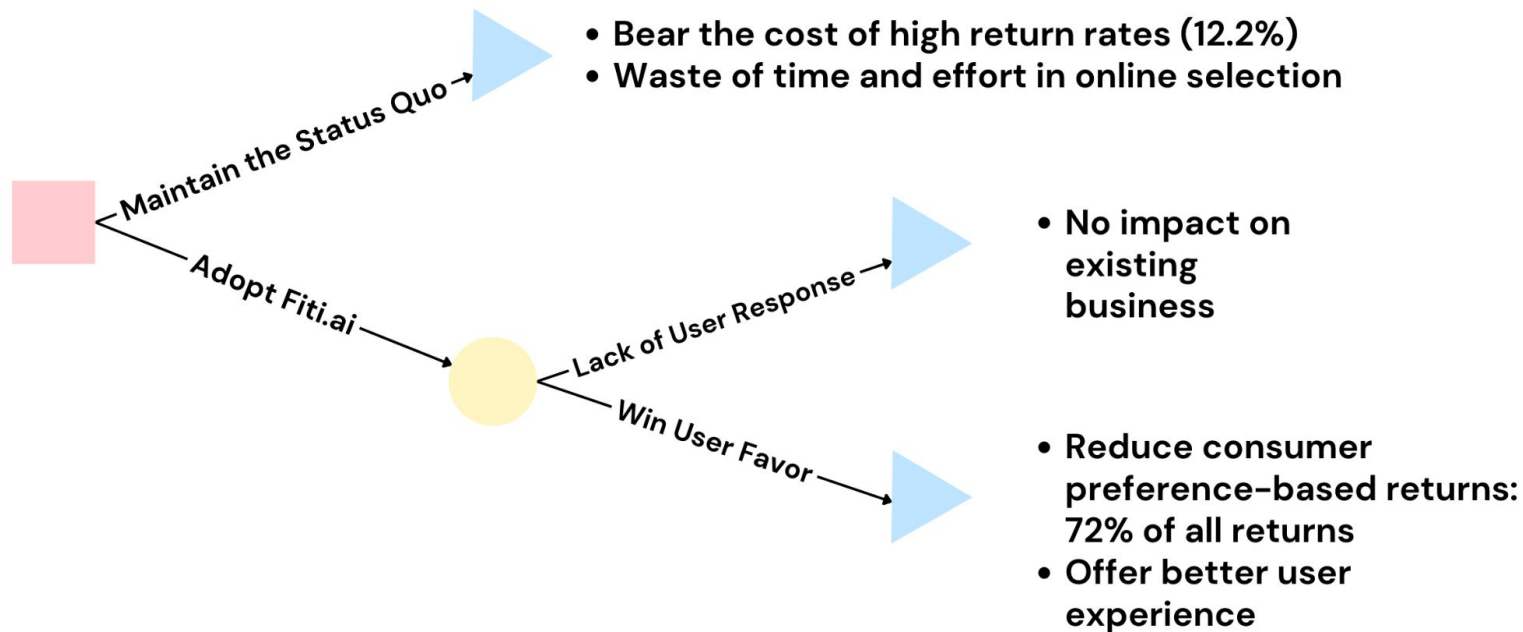


Software Engineer

Develop user interfaces for the MVP and user tests



Value of Data





System Overview

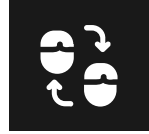
Data Flywheel

Pipeline Architecture

Evaluation Metrics

Future Endeavour

DATA FLYWHEEL



More Users



**Better User
Experience**



Smarter Algorithm



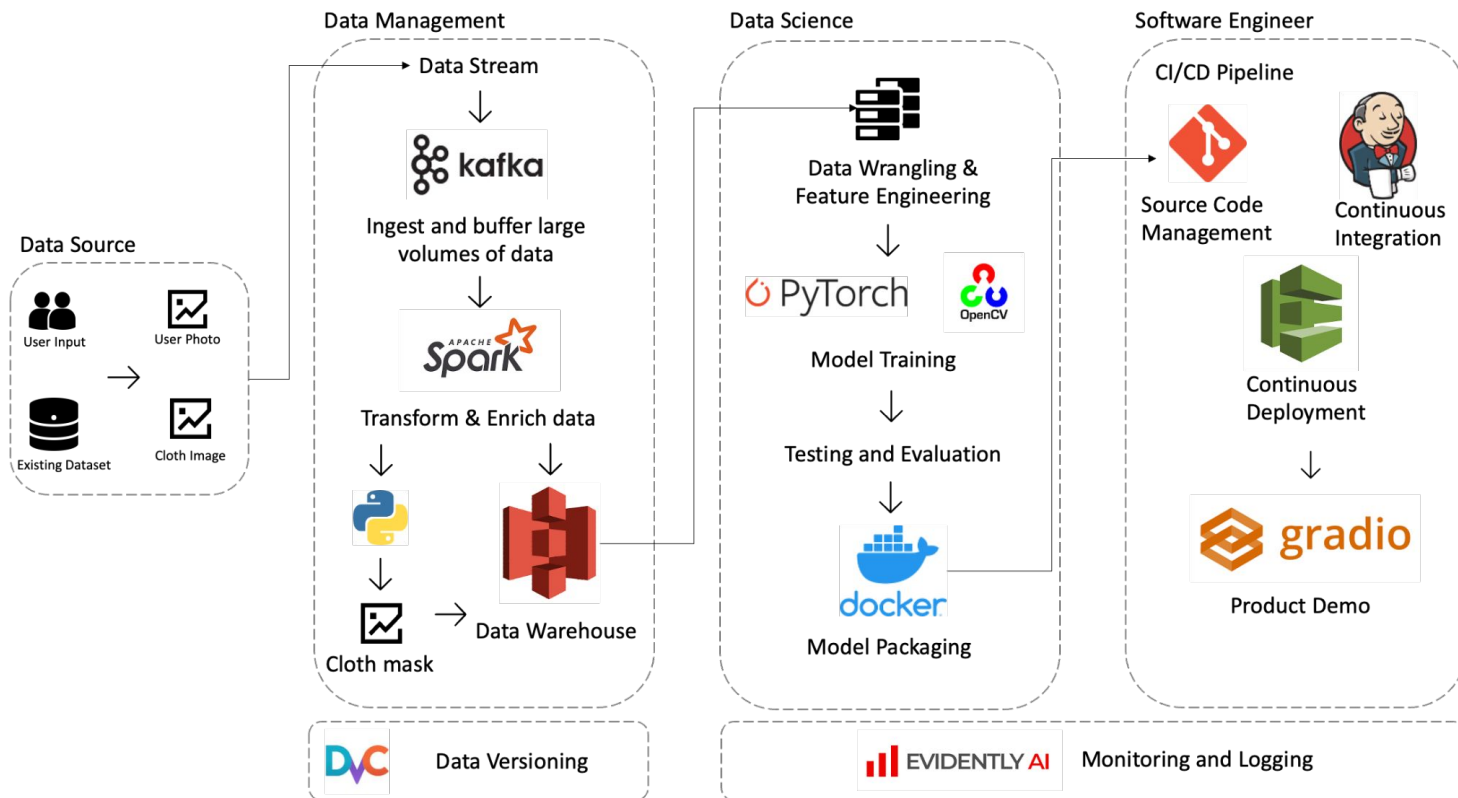
More Data



Human Scoring

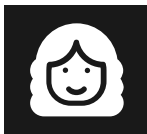


PROPOSED PRODUCT ARCHITECTURE



MODEL & METRICS

VITON Dataset



Frontal-
view
woman



Top
clothing
image

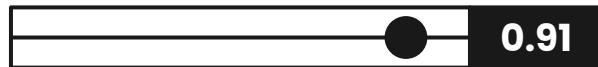
- **Training Dataset:** 14,221 image pairs
- **Testing Dataset:** 2,032 image pairs
- **Augmented Testing Dataset:** Evaluate model's robustness on random positioned person image

Model

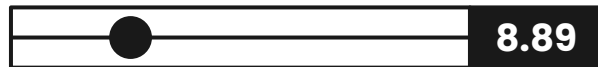
- **Feature Extractor:** CNN
- **Warping Module:** StyleGAN based architecture
- **Generator:** Encoder-Decoder

Metrics

Structure similarity
(SSIM)






Frechet Inception
Distance (FID)

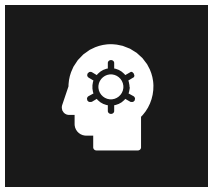




OTHER METHODS

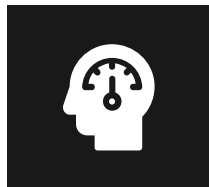
		SSIM	FID
	CP-VTON	0.72	24.45
	ACGPN	0.84	16.64
	OURS	0.91	8.89

Future Endeavor



CI/CD Pipeline

Automate testing to
reduce the misalignment



Data Storage

Save history data for
users' convenience &
model optimization



More Features

Deployment on mobile
devices & Artsy UI design



MVP Demo



Hugging Face Gradio





Implications

Lessons

Proposed Architecture

Latency from Environment



Despite that deep neural network can run on CPU solely, the generation process usually takes **80-120s** to finish, which will cost us losing some users.

With more budgets, the product should be supported by GPU.



More compatible v.s. More instructions



During testing, we figured that some poses tend to return more misalignment with clothes that “pose” differently.

Besides improving the model, we debated about the instructions for the user input, and how to phrase them.



Crossed arms



Arms down to sides



More compatible v.s. More instructions



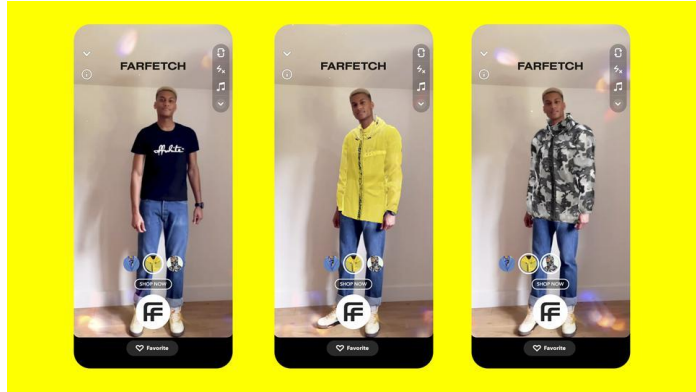
Crossed arms



Arms down to sides

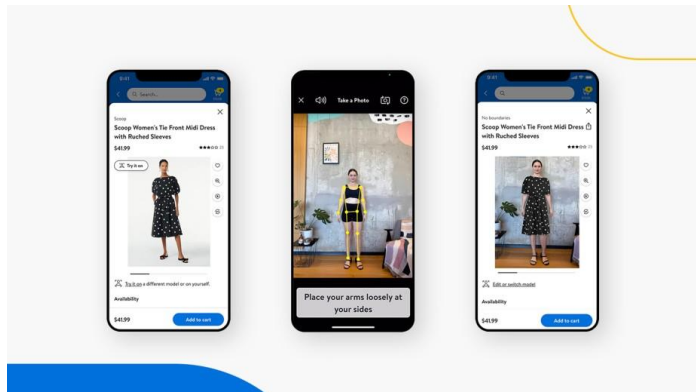


Benchmark against other products



We became aware of the other prevailing virtual try-on tools in the industry:

- Real-time response to body movements & facial dimensions
- Product as an add-in to social media platform





Lessons learned: Conclusion



Improve latency

Better serve users with GPU units
while reducing costs



Add user instructions

"Please have your arms at sides"
"... hands are empty"



Learn other solutions

Augmented reality (AR)
Consistency & Availability





Miscellaneous: Proposed Architecture

The development of a virtual try-on tool involves several technical and non-technical considerations that should be taken into account to ensure a successful product launch.

Scaling considerations	Scale horizontally to allow large traffic of concurrent requests w/o sacrificing performance
Data collection	Include various clothing styles, sizes & user-generated data e.g. preferences and feedback
Data labeling	Automate the labeling of clothing images with attributes like style, size, color
Monitoring & Testing	Monitor by request latency, error rates and malware attack rates
Ethics & Governance	Comply with regulations to protect private data, avoid promoting negative body stereotypes
End-user application type	Release as a web application that can be accessed from any device with internet connection

Thank you

Ask any questions!



REFERENCES

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